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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,972	12/29/2005	Yasuhiro Miyamoto	Q92215	3619

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EXAMINER	
MULLINS, BURTON S	
ART UNIT	PAPER NUMBER
2834	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/562,972	MIYAMOTO ET AL.	
	Examiner	Art Unit	
	BURTON MULLINS	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: Reference to specific claims on pages 5-9 must be removed. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 2000-116105 (JP '105). JP '105 teaches a moving magnet type linear actuator comprising: a stator having a stator base and an armature (Fig.2) including a magnetic iron core 3 fixed on the stator base 11 and an armature winding 12 wound around the magnetic iron core; and a movable body 13 (Fig.12) having a field permanent magnet 14/15 arranged oppositely to the magnetic iron core 3 through a magnetic gap 9 (Figs.1&2) and a magnetic holder 41/42/43 (Fig.12) supporting the field permanent magnet 14/15 and movably arranged on the stator base, wherein the magnetic holder is made of a non-magnetic substance (inherent), a magnetic back yoke 1 (left & right parts, Fig.2) is arranged on the side opposite to the armature with respect to the field permanent magnet (Figs.1&2), a width thereof being approximately equal to a width of the field permanent magnet (Fig.1), a length thereof being not smaller than the stroke of the movable body (Fig.2), and both ends thereof in the longitudinal direction being fixed to the stator (i.e., one end of each left and right yoke 1 is fixed to stator; Fig.2), and a gap 9 is formed between the magnetic yoke 1

and the field permanent magnet 14/15 (Figs.1&2).

Regarding claim 7, as seen in Fig.1, the yoke 1 comprises laminated plates.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Korenaga et al. (US 6,037,680). Korenaga teaches a moving magnet type linear actuator comprising: a stator (fixed unit; Fig.1) having a stator base (not shown, inherent since stator is 'fixed') and an armature 10 including a magnetic iron core (center yoke) 6 fixed on the stator base and an armature winding 8/9 wound around the magnetic iron core 6; and a movable body (stage) 2 having a field permanent magnet 5 arranged oppositely to the magnetic iron core 6 through a magnetic gap (Figs.1-3&4C) and a magnetic holder (holding plates) 4 supporting the field permanent magnet 5 and movably arranged on the stator base, wherein the magnetic holder is made of a non-magnetic substance (inherent), a magnetic back yoke (side yoke) 7 is arranged on the side opposite to the armature with respect to the field permanent magnet (Figs.1-3&4C), a width thereof being approximately equal to a width of the field permanent magnet (Figs.1-3&4C), a length thereof being not smaller than the stroke of the movable body (Figs.1-3), and both ends thereof in the longitudinal direction being fixed to the stator (Figs.1-3), and a gap is formed between the magnetic yoke 7 and the field permanent magnet 5 (Figs.1-3&4C).

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korenaga in view of applicant's admitted prior art (see discussion on pp.1-2 and Figs.3a-3b of specification).

Korenaga teaches applicant's invention but does not teach a scale fixed to the magnetic holder, and a detecting segment fixed to the stator base (claim 2); or two linear guides arranged in parallel so as to sandwich both sides of the armature, guide blocks are arranged on each of the linear guides, and the magnetic holder fixed on the guide blocks (claim 3).

Applicant's admitted prior art teaches a scale segment of a linear scale 53 fixed to the side of a magnetic holder (yoke) 23 of the movable body 20, and a detecting segment 52 of the linear scale is fixed to the stator base 31 with a gap from the scale segment 53 (specification p.3; Figs.3A-3B). Further, two linear guides 41 are arranged in parallel so as to sandwich both sides of the armature 32 (Fig.3B), guide blocks 42 are arranged on each of the linear guides 41, and the magnetic holder (yoke) 23 is fixed on the guide blocks for forcibly stopping the running of the actuator at either end thereof (specification p.3; Figs.3A-3B).

It would have been obvious to modify Korenaga and provide a scale and detector per applicant's admitted prior art to detect the position of the movable body, and to provide linear guides and guide blocks per JP '328 to forcibly stop the running of the actuator at either end thereof.

Regarding claim 4, Korenaga Fig.3 shows that the non-magnetic holder 4a includes a square cut out or slot for the magnet 5. The width of the slot would correspond to the space between the guide blocks of JP '328 since these would be arranged between the yokes 7, which surround the armature, the latter having generally the same width as the magnet 5 (Korenaga, Fig.3).

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Korenaga and JP 2000-308328, in view of Tsuboi et al. US 2001/0048249. Neither Korenaga nor JP '328 teach stoppers on the linear guides.

Tsuboi teaches stoppers 18, 20 (Figs.1-2) at each end 17, 19 of linear guides, thereby acting as buffers for protecting slider 6 from collision [0051].

It would have been obvious to modify Korenaga and JP '328 and provide stoppers per Tsuboi to protect the slider from collision.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Korenaga in view of Hwang et al. (US 6,528,907). Korenaga teaches applicant's invention but does not teach guide pipes in the stator for cooling refrigerant.

Hwang teaches a linear motor with a stator 54 and stator coils 53, the stator having guide pipes (cooling channels) 7 for forcible cooling refrigerant (e.g., air) embedded in the stator base (back plate) 50 (Fig.8; c.4:50-63). The cooling channels provide effective cooling of the stator (c.1:60-64).

It would have been obvious to modify and provide a stator with guide pipes per Hwang to cool the stator.

Response to Arguments

9. Applicant's arguments filed 25 July 2008 have been fully considered but they are not persuasive.

10. Regarding JP '105, applicant argues that it is not necessary for the magnetic holder 41/42/43 (Fig.12) to comprise non-magnetic material since "even if [the holder is] made of

magnetic materials, the linear motor can work" and "light weight, flexible magnetic materials [exist]." In response, the examiner notes that for issues concerning implicit disclosure it has been held that "[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968).

There are five reasons drawn from specific teachings in JP '105 for inferring that the reference implicitly teaches a non-magnetic holder even though this feature is not explicitly described (in the machine translation, at least):

1) The flux-lines seen in Figs.2-4&15-16 do not include lines through the magnetic holder 16/41. If the holder was magnetic, flux from the magnets passing through the holder axially would be shown. Other magnetic loops would also form through the rest of the holder structure, such as those crossing the bridges between the two sides of the movable body 13 (Figs.12-13), but these are not shown. Like electrical current, the magnetic flux will always take the path of least resistance, but there are no indications that a path through the holder 16/41 offers this, which would necessarily be the case if it were magnetic material. Magnetic permeability (μ) for magnetic material is much higher than for air (free space). For example, for iron, relative permeability (μ_r) is $150 < \mu_r < 5000$.

2) The description of JP '105 makes no mention or inference of any magnetic loops other than those shown in Figs.2-4.

3) There would be no need for the inner yoke 1 since the magnetic holder of magnetic material would perform the function of passing flux. In other words, a magnetic holder of magnetic material would make the yoke redundant.

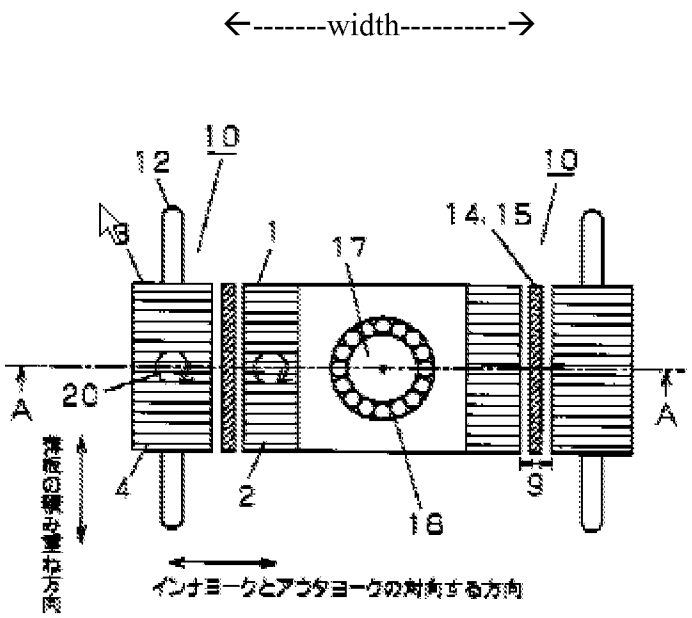
4) If the magnetic holder comprised magnetic material, flux would circulate through the holder, thus increasing iron loss and reducing thrust, contrary to the explicit intention in JP '105 (see abstract). See also paragraphs 49-50 of the machine translation describing the loop the flux travels.

5) While light, flexible magnets exist, applicant has provided no evidence that they exist as supports for other magnets, i.e., that magnets are used as "magnetic holders". Support for the opinion that the holder is non-magnetic comes from paragraphs 103-107 which describe the "flexible" region 13 formed by the "frame" 40, "interval" 41, "supporter" 42 and "spacer" 44. The flexible region is light in weight (par.109). Flexibility and light weight are not characteristic of magnetic materials used to support magnets.

Concerning applicant's argument that the linear motor "can" work with a magnetic holder, the examiner notes that it would not work as described since the multiple magnets 14 & 15 would in essence comprise a single magnet rather than separate magnets of opposing magnetic orientation providing distinct poles. Operation, as can be seen from Figs.2-4&15-16, depends upon magnetic flux lines passing radially through the magnets 14&15 and inner and outer yokes 1 and 3.

Regarding applicant's argument that the width of the magnetic back yoke 1 in JP '105 is not approximately equal to a width of the field permanent magnet 14/15, it is evident from cursory inspection of Fig.1 that the magnetic back yoke 1 is "approximately equal" to a width of

the field permanent magnet 14/15. "Width" is taken to refer to the transverse length spanned by the yoke 1 and movable section 13 comprising the permanent magnets 14/15, as seen axially from above in Fig.1 and annotated below. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).



11. Regarding Korenaga, applicant argues that the magnetic holder 4 is not inherently made of non-magnetic material. Again, it is noted that Korenaga's machine would not function properly if the magnetic holder 4 comprised magnetic material since flux from the magnets 5 would divert through the holder and reduce the magnetic flux in the yokes 6 and 7, thus reducing the flux interacting with the coils, which is what makes the stage move. This is contrary to the operation of the motor taught at c.10:7-17. Flux from a magnet 5 enters the center yoke 6,

branches forward and backward in the longitudinal direction to reach the two end portions of the yoke, branches up and down to enter the side yokes 7, and flows from the front and rear end portions to oppose magnet 5 and reach the S pole of the opposing magnet 5. This magnetic circuit would not operate properly if the holder were magnetic since flux flow would divert down the side of the holder to complete another circuit between the magnets, rendering the machine inefficient at best, inoperable at worst. One of ordinary skill would realize that the holder is non-magnetic.

12. Regarding the rejection of claims 2-4 as unpatentable over Korenaga in view of JP 2000-308328, applicant's argument is not persuasive since the prior art JP -328 teaches linear scale 53 is on yoke 23 (pp.2-3 and Fig.3b). The yoke 23 comprises a "magnetic holder" in the sense that yoke "holds" or supports magnets 21. Further, the yoke 23 is movable since it is part of "movable body" 20. The issue of whether or not the prior art magnetic holder is non-magnetic is not germane since the feature of a non-magnetic structure is disclosed by Korenaga. As stated in the rejection, "Korenaga teaches applicant's invention but does not teach a scale fixed to the magnetic holder, and a detecting segment fixed to the stator base (claim 2)". Arguments against the references individually are not persuasive since one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). While applicant states that the feature of a scale attached to a non-magnetic structure is "important", no evidence beyond this assertion is given and thus applicant's argument has no merit.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BURTON MULLINS whose telephone number is (571)272-2029. The examiner can normally be reached on 9-5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571)272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BURTON MULLINS/
Primary Examiner, Art Unit 2834

bsm
01 September 2008